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OKLAHOMA'S GROUNDWATER: REDUCING THE POLLUTION CAUSED BY IMPROPERLY PLUGGED OIL AND GAS WELLS*

I. INTRODUCTION

Water—we can't exist without it. We drink it; we wash in it; we grow our crops and raise our livestock with it; we transport our industrial and municipal waste with it; and we generate electrical power to run our industries and homes with it. Approximately fifty-six percent of Oklahoma's fresh water is groundwater,¹ that is, water which "has percolated downward from the surface, filling voids or open spaces in the rock formations."² Over 1.2 million people in Oklahoma (forty-one percent of the total population)³ are served by twelve major and one hundred fifty minor underground water basins which make up Oklahoma's groundwater resources.⁴

A source of pollution and contamination of Oklahoma groundwater comes from abandoned, unplugged, or improperly plugged oil and gas wells leaking oil, gas, salt water, and other deleterious substances into the groundwater. It is ironic that one of the most serious and insidious threats to such an important natural resource, groundwater, comes from production of another valuable and finite resource, petroleum. In Oklahoma, limiting pollution from oil and gas wells is the job of the Corporation Commission.

II. GROUNDWATER AND ABANDONED WELLS

Although the following information pertains to the United States as

* The author thanks the following Oklahoma Corporation Commission employees for their assistance in compiling data used in this Comment: Mike Battles, Manager, Pollution Abatement, Oil and Gas Conservation Division; Shirley Flies, Esq., and Ben Jackson, Esq., Office of the General Counsel; Rick Conners, Manager, Department of Statistics; Kelly Phelps, Field Inspector; and Ward Byers, Director, Support Services.

1. OKLAHOMA WATER RESOURCES BD., OKLAHOMA'S WATER ATLAS 347 (Nov. 1984) [hereinafter WATER ATLAS].

2. U. S. GEOLOGICAL SURVEY, WATER-SUPPLY PAPER NO. 2275, NATIONAL WATER SUMMARY 1984: HYDROLOGIC EVENTS, SELECTED WATER-QUALITY TRENDS, AND GROUND WATER RESOURCES, 14 [hereinafter NATIONAL WATER SUMMARY].

3. WATER ATLAS, *supra* note 1, at 347.

4. NATIONAL WATER SUMMARY, *supra* note 2, at 23.

a whole,⁵ the magnitude of the threat to Oklahoma's groundwater resources can be inferred from the following statistics. In the United States, approximately 2,676,000 holes have been drilled for oil and gas⁶ since the first petroleum-related well was drilled in 1859, with approximately 30,000 new wells drilled annually.⁷ Today, there are approximately 746,000 producing wells;⁸ therefore, pollution could come from approximately 1,930,000 dry holes or abandoned wells.⁹ Additionally, this country daily disposes of more than 30 million barrels of oil field brine.¹⁰ Oklahoma is one of the top five producing states for both oil and gas in the United States.¹¹ These statistics indicate that there is indeed a potentially great threat to our groundwater resources. But even these figures do not show the total magnitude of the problem of leaking wells. In addition, there are millions of other types of wells drilled¹² which may contribute to the pollution of groundwater.

Oil and gas wells are usually abandoned because of unsuccessful initial drilling (dry holes) or because the cost of production exceeds the revenue generated after the well has been producing for some time.¹³ In the past, before current stringent methods for plugging wells were enacted, wells were often plugged with a tree trunk or covered by a board or piece of sheet metal.¹⁴ Abandoned wells have served as receptacles for household garbage, dead animals, worn out machinery, and liquid wastes.¹⁵ Unplugged or improperly plugged wells act as natural conduits for the movement of oil, gas, salt water, or other deleterious substances into any groundwater strata through which the well may have been drilled. Through seepage, the substances may enter groundwater strata

5. The author could not establish specific figures for the State of Oklahoma.

6. Fryberger & Tinlin, *Pollution Potential from Injection Wells Via Abandoned Wells*, in PROCEEDINGS OF THE FIRST NATIONAL CONFERENCE ON ABANDONED WELLS: PROBLEMS AND SOLUTIONS 84, 85 (D. Fairchild 1984) [hereinafter PROCEEDING].

7. Canter, *Problems of Abandoned Wells*, in PROCEEDINGS, *supra* note 6, at 2 (citing U.S. Environmental Protection Agency 1975).

8. Fryberger & Tinlin, *supra* note 6, at 85.

9. *Id.*

10. *Id.*

11. Canter, *supra* note 7, at 2.

12. *Id.* at 4. Other types of wells include municipal and private water wells, waste injection wells, and energy or mineral extraction wells. *Id.*

13. OKLA. CORP. COMM'N, THE ANNUAL REPORT OF THE OKLAHOMA CORPORATION COMMISSION, FISCAL YEAR 1985 at 128 (1985) [hereinafter OKLA. CORP. COMM'N 1985 ANNUAL REPORT].

14. T. GASS, J. LEHR, & H. HEISS, JR., IMPACT OF ABANDONED WELLS ON GROUND WATER 1 (U.S. Environmental Protection Agency, EPA-600/3-77-095, Aug. 1977) [hereinafter ABANDONED WELLS].

15. *Id.*

the wells do not pierce. Rusted casing or the absence of cement casing can also provide holes or openings for pollutant migration.¹⁶

Few detailed studies have been conducted on the exact effect of unplugged or improperly plugged oil and gas wells on groundwater. Explanations for the lack of research on this type of pollution include: the slow movement of groundwater and contamination; limited monitoring networks and data; and the presence of other pollution sources.¹⁷

III. OKLAHOMA'S RESPONSE TO ABANDONED WELLS

In response to the pollution of our groundwater supply from leaking oil and gas wells, the Oklahoma legislature in 1965 passed an act providing the Oklahoma Corporation Commission (Commission) with the authority, power, and responsibility to plug, replug, or repair abandoned wells.¹⁸ The purpose of the Act is to protect the waters of the state against pollution, and it gives the Commission "additional means"¹⁹ to plug, replug, or repair oil and gas wells that are polluting fresh groundwater.²⁰ The Commission was given the power to help reduce the pollution of groundwater by plugging leaking wells because the Commission has the exclusive power to regulate oil and gas operations in Oklahoma.²¹ Specifically, the Commission is authorized to promulgate rules and regulations for the plugging of abandoned oil and gas wells.²²

Although the Oklahoma Constitution does not explicitly give the Commission the powers to direct and enforce the Act,²³ the Oklahoma Supreme Court has upheld the constitutional authority of the legislature to place control of natural resources within the jurisdiction of the Commission.²⁴ In a 1984 opinion, the Oklahoma Attorney General, citing prior state supreme court cases, held that the provisions of the Oklahoma statutes granting the Commission jurisdiction over the regulation of oil

16. See *id.*; see also Canter, *supra* note 7, at 8.

17. Canter, *supra* note 7, at 4.

18. Act effective June 8, 1965, ch. 191, § 1, 1965 Okla. Sess. Laws 333 (codified as amended OKLA. STAT. tit. 52, §§ 309-318.1 (1981 & Supp. 1986)) (while the Act has been slightly amended and supplemented, the Corporation Commission's power to plug wells to stop pollution remains substantially the same).

19. For a good introduction as to what other "additional means" are available to the State for plugging and replugging wells, see Note, *Oil and Gas: The Expanding Liability for the Improper Plugging of Oil and Gas Wells in Oklahoma*, 29 OKLA. L. REV. 763 (1976).

20. OKLA. STAT. tit. 52, § 309 (1981).

21. OKLA. STAT. tit. 17, § 52 (Supp. 1986).

22. OKLA. STAT. tit. 17, § 53 (1981).

23. OKLA. CONST. art. IX, §§ 15-35 (Creation, Powers and Duties of the Corporation Commission).

24. *Russell v. Walker*, 160 Okla. 145, 155, 15 P.2d 114, 124 (Okla. 1932).

and gas in Oklahoma were constitutional.²⁵ In addition to the Commission's legislative powers, the state constitution has also been interpreted as giving the Commission the power and authority of a court of record.²⁶ This includes the power to punish violations of its rules and regulations with contempt proceedings. The Commission's powers are constitutional as long as they are not inconsistent with the powers provided by the constitution.²⁷

The Act allows the Commission, after notice and hearing, to determine whether a well drilled for the exploration, production, or development of oil and gas is causing or is likely to cause pollution. If the party cannot be found or is financially unable to pay the cost of the necessary work, the Commission may enter onto the land and plug, replug, or repair as necessary to stop the pollution.²⁸ The Act further provides that if an emergency exists, such as when the well is actually leaking deleterious substances into the groundwater, the Commission may make the necessary repairs without notice and hearing.²⁹ If the parties responsible for the leaking well can be found, the Commission has the authority to seek reimbursement for its expenditures.³⁰

The compliance portion of the Act requires any person who drills or operates any well for the exploration, development, or production of oil or gas to provide, in writing, an agreement to plug the well in compliance with the rules and regulations of the Commission.³¹ This section also requires the person responsible for the well to provide evidence of financial ability to comply with the Commission's rules and regulations. Evidence of financial ability is shown by either a financial statement showing net worth of at least \$50,000;³² an irrevocable letter of credit for \$25,000;³³ a blanket surety bond for \$25,000;³⁴ or, cash, cashier's check, certificate of deposit, or other negotiable instrument of \$25,000.³⁵ The Act further provides that noncompliance with the Commission's rules

25. 84 Op. Att'y Gen. 191, 194 (1985).

26. *Tenneco Oil Co. v. El Paso Natural Gas*, 687 P.2d 1049, 1050 (Okla. 1984). The Commission's jurisdiction is limited, however. *Id.* at 1053.

27. *Id.* at 1053.

28. OKLA. STAT. tit. 52, § 310(A) (1981 & Supp. 1986).

29. *Id.*

30. *Id.* § 310(B).

31. *Id.* § 318.1(A).

32. *Id.* § 318.1(A)(1).

33. *Id.* § 318.1(A)(2).

34. *Id.* § 318.1(A)(4).

35. *Id.* § 318.1(A)(3). This most recent provision effective July 1, 1986, adds a new way of establishing evidence of financial ability. *Id.*

results in either forfeiting the bond, cash, or letter of credit; or paying the Commission a deposit equal to the cost of plugging the well.³⁶ The Commission may recover all costs expended to plug the well and attorney's fees.³⁷ Other statutory enforcement mechanisms available to the Commission are discussed below.³⁸

Other provisions of the Act provide *inter alia* that any person who plugs, repairs, or replugs a well pursuant to Commission order or authority will not be held liable for damages resulting from the operations other than damages to growing crops and land improvements.³⁹ The fact that a person has remedied or attempted to remedy the condition of a well pursuant to the Act will not be construed as an admission of liability in any action where damage to fresh water is an issue.⁴⁰ Any person who plugs or repairs a well without being obligated to do so by the Act has a cause of action for reimbursement against the person responsible and a lien on the interest of the obligated person in the oil and gas rights in the land, and equipment located there.⁴¹ Furthermore, state contracts for plugging must be let by competitive bidding.⁴²

To stop pollution of groundwater, the Act provides the legislative authority by which the Commission may order abandoned wells plugged or repaired. But, it is the Oklahoma Corporation Commission, Oil and Gas Conservation Division, in its General Rules and Regulations (OCC-OGR), which actually details the direction, compliance, and enforcement of the Act.⁴³ As discussed earlier, the Act requires drillers and operators to agree in writing to comply with these rules and regulations in order to do business in Oklahoma.⁴⁴ The OCC-OGR require that the "owner and operator of any oil, gas, disposal, injection, or other service well, or any . . . other exploratory hole . . . shall be jointly and severally liable and responsible for plugging thereof in accordance with these rules."⁴⁵ Briefly, the OCC-OGR contain the following provisions: when the well

36. *Id.* § 318.1(B).

37. *Id.*

38. *See infra* pp. 586-87.

39. OKLA. STAT. tit. 52, § 311 (1981).

40. *Id.* § 313.

41. *Id.* § 314.

42. *Id.* § 318.

43. *See* OKLA. CORP. COMM'N, OIL AND GAS CONSERVATION DIV., GEN. RULES AND REGULATIONS 3-400 to 409 (1986) (as amended) [hereinafter OCC-OGR] (Abandonment and Plugging of Wells). Authority for promulgating these rules and regulations is given by OKLA. STAT. tit. 17, § 53 (1981).

44. OKLA. STAT. tit. 52, § 318.1 (1981 & Supp. 1986).

45. OCC-OGR, *supra* note 43, at 3-401(A).

shall be plugged, and exemptions from plugging;⁴⁶ notice requirements;⁴⁷ Commission supervision of plugging;⁴⁸ plugging methods;⁴⁹ plugging record filing requirements;⁵⁰ procedures for abandoning radioactive sources in wells;⁵¹ requirements for plugging exploratory holes;⁵² standards for plugging wells to be used for fresh water;⁵³ and licensing requirements for persons plugging wells.⁵⁴

The rules and regulations set forth by the Oklahoma Corporation Commission have the force and effect of law.⁵⁵ Furthermore, the Oklahoma Supreme Court has declared constitutional the statute⁵⁶ which gives the Commission authority to prescribe rules for plugging abandoned wells.⁵⁷

The Oklahoma Constitution gives the Commission the power and authority of a court of law.⁵⁸ The Oklahoma Legislature has detailed the form and manner with which actions taken by the Commission are to be conducted.⁵⁹ "[T]he Commission is a constitutional body possessed of"⁶⁰ its own "executive, legislative, and judicial" power.⁶¹ An appeal from the Commission must go directly to the Oklahoma Supreme Court.⁶² On appeal, the supreme court is not required to weigh the evidence, but only to review the evidence, and may affirm an order if "the finding and conclusions of the Commission are sustained by law and substantial evidence."⁶³

The orders pertaining to abandoned wells are filed in the Oklahoma Corporation Commission Secretary's office in Oklahoma City, Oklahoma; there are no "reporters" containing Commission orders, hearings, and proceedings. Commission findings and summaries of pro-

46. *Id.* at 3-401(B) to (J).

47. *Id.* at 3-402 (five-day notice before plugging operations).

48. *Id.* at 3-403.

49. *Id.* at 3-404.

50. *Id.* at 3-405 (newly drilled or deepened wells that are plugged must file Plugging Record within 30 days).

51. *Id.* at 3-406.

52. *Id.* at 3-407.

53. *Id.* at 3-408.

54. *Id.* at 3-409.

55. *Ashland Oil, Inc. v. Corporation Comm'n*, 595 P.2d 423, 426 (Okla. 1979).

56. OKLA. STAT. tit. 17, § 53 (1981).

57. *Amox Petroleum Corp. v. Corporation Comm'n*, 552 P.2d 387, 391 (Okla. 1976).

58. OKLA. CONST. art. IX, § 19.

59. OKLA. STAT. tit. 52, § 316 (1981).

60. *Tenneco Oil Co. v. El Paso Natural Gas Co.*, 687 P.2d 1049, 1052 (Okla. 1984).

61. *Id.*

62. *See Drake v. Southwest Davis Unit*, 698 P.2d 15, 16-17 (Okla. 1985).

63. *Currey v. Corporation Comm'n of Okla.*, 617 P.2d 177, 179 (Okla. 1980) (citations omitted), *cert. denied*, 452 U.S. 938 (1981).

ceedings are filed with individual case files and often are terse two-page orders. These orders generally contain title summaries stating the purpose of the order or proceeding; the location of the problem well; the location or availability of the person responsible for plugging the well; a brief summary of the Commission field inspector's investigations; recommendations for resolution of the problem; and, the order or decision of the Commission.⁶⁴

IV. APPLICATION OF THE ACT

Actions in which the Act is applied can be divided into two groups: (1) actions where the Commission plugs the well itself because the party responsible cannot be found, or is unable or unwilling to plug the well, and (2) actions where the party responsible is found in contempt and fined for not complying with Commission rules and regulations by properly plugging the well.

A. *Actions Where the State Plugs the Well*

In Pollution Docket (PD) Cause Number 17323,⁶⁵ a local health department requested that the Commission plug a leaking well. A well drilled and abandoned around 1971 was purging gas bubbles up to the surface near a public swimming pool. The person responsible for plugging the well was unknown, and the purging gas presented an immediate danger to the people using the pool. The well was located by its outward manifestations, and any groundwater sources near the well could have been contaminated by the gas unless the well was plugged. The state, under jurisdiction of the Act, plugged the well.

Pollution of Blackwell, Oklahoma's source of public water caused the Commission to plug a well in case PD 15344.⁶⁶ An abandoned well, located in the middle of a creek feeding into the Chickaskia River, was purging gas. The water from the creek and river fed into a reservoir, which was used as Blackwell's public water supply, and created a potentially great health hazard. An oil company drilling in the area noticed tubing sticking out of the water like a periscope. A chemical analysis of

64. Appendix A contains information about wells the Commission actually plugged, replugged, or repaired. Appendix B represents those cases where the Commission located the party responsible and fined the person for not properly plugging the well.

65. Okla. Corp. Comm'n Order No. 298098, Pollution Docket Cause No. 17323 (May 14, 1986). Subsequent citations will be Commission Order No., PD No., and date.

66. Commission Order No. 264930, PD No. 15344 (Sept. 6, 1984).

the water showed that gas was purging, and the Commission plugged the pollution source.

The Commission is not always called to plug only individual wells. In PD 15827,⁶⁷ the Commission authorized the expenditure of funds pursuant to the Act for simultaneously plugging sixty-five wells in one county because they were purging and causing pollution of a fresh water strata. In PD 17260⁶⁸ the Commission plugged fourteen wells.

Some wells are easier to locate than others, as in PD 17924⁶⁹ where a homeowner awakened one day to find a six foot deep crater in his back yard. The crater was caused by the cave-in of land surrounding an improperly plugged and covered well. The well was purging natural gas which not only threatened groundwater, but posed a potentially explosive problem above ground. Though there were no records to show who drilled or abandoned the well, the Commission, pursuant to the Act, was able to plug this dangerous well.⁷⁰

B. Contempt Proceedings and Findings

As well as actually plugging problem wells, the Commission is authorized to punish persons who fail to follow Commission rules and regu-

67. Commission Order No. 275534, PD No. 15827 (Apr. 1, 1985).

68. Commission Order 293834, PD No. 17260 (Feb. 28, 1986).

69. Commission Order 302125, PD No. 17924 (Aug. 26, 1986).

70. These cases are only a sample; more cases are summarized in Appendix A. Appendix A includes cases, reviewed at the Oklahoma Corporation Commission offices in Oklahoma City, Oklahoma, where the Commission actually plugged wells. The Pollution Docket Number, Corporation Commission Order Number, order date, number of wells plugged, and cost figures came from the Commission Orders themselves. The Miscellaneous Notes came from a review of the Commission's investigator reports and pictures of the wells contained in the document file of each Order. The sample was taken from a Commission listing of active cases prosecuted within the past two years.

The following schedule summarizes recent Commission well-plugging activity. It is a compilation of figures provided by the Corporation Commission. There are presently no formal published documents with this information, but the figures were provided upon request.

	<u>1984</u>	<u>1985</u>	<u>1986</u>
Number of Wells Plugged with State Funds	58	33	161
State Funds Used For Well Plugging	\$135,018	\$136,205	\$234,326
State Funds Budgeted for Well Plugging	\$175,000	\$175,000	\$500,000*

* Budget figure includes \$175,000 in Conservation Funds (as in previous years), plus authorization to spend up to \$325,000 in certain oil and gas fines. Actual fines collected in the year were \$92,272; therefore, the available budget for 1986 was \$267,272.

lations.⁷¹ This punishment is primarily in the form of contempt proceedings and fines.⁷² The statute allows the Commission to fine a person up to \$5,000 per day per violation for violating Commission rules or regulations.⁷³ Appendix B shows some of the various fines imposed for violations of the Act.⁷⁴ The latitude exercised by the Commission is shown by the variance of the fines found in the orders surveyed for this Comment, which ranged from \$500⁷⁵ to \$698,000.⁷⁶

Contempt orders usually contain the following information: the location of the problem well; a citation to the Act giving the Commission subject matter jurisdiction over the problem; a brief statement of the problem;⁷⁷ a statement of an expert witness affirming that the problem exists; and a statement of the fine assessed or settlement agreement made.

Contempt orders are similar to state plugging orders in that they are usually brief documents with the above-mentioned information. Unlike court cases reported in the national reporter system, which describe the courts' rationale for applying a rule, statute, or case law, these orders merely state that there is a rule violation and announce a fine.

The fines available⁷⁸ prove that the Act has teeth to enforce compliance with the Commission's rules and regulations for well plugging. It is in the public's interest to protect the state's water from pollution,⁷⁹ and the Act provides a way to ease the problem by plugging leaking wells. It imposes a strong financial deterrent to enforce compliance with the state's rules and regulations designed to prevent or stop pollution.

As water becomes more scarce and valuable, state legislators will likely allocate more manpower⁸⁰ to find, investigate, and correct the

71. OKLA. STAT. tit. 52, § 102 (Supp. 1986).

72. *Id.*

73. *Id.* Although the statute provides a guideline for fines, the Commission is free to negotiate settlements.

74. Appendix B was prepared from case files located at the Oklahoma Corporation Commission Secretary's Office in Oklahoma City, Oklahoma. The sample was drawn from a list of active files within the past year.

75. Okla. Corp. Comm'n Order No. 294722, Cause Enforcement No. (EN) 000137 (May 8, 1986) (Respondent Fred B. Cosper).

76. Commission Order No. 294513, EN No. 000043 (Mar. 11, 1986) (Respondent Gulf Am. Resources, Inc.).

77. The problem statement is usually two to four sentences stating how long the well had been abandoned, whether the well had been plugged improperly, and what efforts had been made to locate the party responsible for plugging the well.

78. OKLA. STAT. tit. 52, § 102 (Supp. 1986).

79. OKLA. STAT. tit. 52, § 309 (1981).

80. The latest information available shows that in 1985 the Commission had only 56 field inspectors to cover all 77 counties in Oklahoma. OKLA. CORP. COMM'N 1985 ANNUAL REPORT, *supra* note 13, at 90. While there are 56 inspectors, they have many other jobs in addition to looking for

problem of unplugged or improperly plugged wells so that the water we have remains clean. The application and enforcement of the Act provides a way by which the state can minimize pollution of groundwater by unplugged or improperly plugged oil and gas wells.

C. *The Act and Its Enforcement*

The provisions of the Act and its accompanying rules and regulations are fairly detailed and provide valuable guidelines for compliance and the penalties for non-compliance. However, many issues remain.

1. Statute of Limitation

The Act does not provide a statute of limitation under which an action could be brought against a non-complying party. However, the Oklahoma Supreme Court held in *Harper-Turner Oil Co. v. Bridge*⁸¹ that a two-year period from the time the damage is apparent applies.⁸² The court in *Harper-Turner* held that title 12, section 95, subsection 3 of the Oklahoma Statutes applies to actions concerning either trespass on real property or injury to the rights of others, and therefore applies to actions prosecuted under the Act.⁸³ This view has been affirmed recently in *Collis v. Ashland Oil & Refining Co.*,⁸⁴ where the Tenth Circuit held that the relevant statute of limitation for pollution is two years, and that the statute of limitation does not begin to run until it is obvious that damage from pollution is of a permanent nature.⁸⁵ In short, the limitation to bring an action against a party under the Act is two years, and does not begin to run until it is obvious to a reasonable person that damage has occurred.

2. Indian Lands

Considering Oklahoma's Indian population, another important issue is the power of the Commission to enforce compliance with the Act on

abandoned wells. The inspectors are scattered over four district headquarters located at Bristow, Kingfisher, Duncan, and Ada. *Id.*

81. 311 P.2d 947 (Okla. 1957).

82. *Id.* at 949.

83. *Id.*

84. 722 F.2d 625 (10th Cir. 1983). The court held that under Oklahoma law, the relevant two-year statute of limitation did not begin to run until it became obvious that damage was of a permanent character. *Id.* at 626-27. The landowner sued the oil company alleging his land and cattle suffered damage from saltwater pollution caused by two old wells that the oil company improperly plugged. *Id.* at 625.

85. *Id.* at 626.

restricted Indian lands. This issue was decided by the Oklahoma Supreme Court in *Currey v. Corporation Commission*.⁸⁶ In *Currey*, a Commission order to repair and replug oil and gas wells which were purging salt water was appealed by defendants, who were operators of an oil and gas lease on Choctaw Indian lands. The defendants contended that the Commission had no jurisdiction to order replugging or reworking the wells because they were located on restricted Indian lands, and were therefore under the exclusive jurisdiction of the federal government. The court first explained that federal jurisdiction is not invariably exclusive jurisdiction.⁸⁷ The court held that the Commission's power "to regulate oil and gas conservation measures under the laws of the state on restricted Indian lands and order appellant to replug purging wells, is not precluded by the federal jurisdictions."⁸⁸ *Currey* was cited as the basis of an attorney general opinion holding that the Commission may enter Osage Indian lands for the purpose of plugging or repairing an oil or gas well that has been abandoned and is leaking deleterious substances into a fresh water formation.⁸⁹

3. Locating Pollution Sources

Although one may be able to taste or smell the effect of a polluting well in a water supply, or a chemical analysis of a reservoir may indicate that a well is leaking deleterious substances into that supply, the Commission cannot act unless the actual polluting well is found. Finding these wells is a major problem. The problem is particularly acute with older wells because many in the early 1900's were drilled without recording the location, depth, or completion of the well.⁹⁰ As time has passed better records have been kept, but locations can still be nebulous or inaccurate.

There are many ways to locate polluting wells.⁹¹ A record search

86. 617 P.2d 177 (Okla. 1979), *cert. denied*, 452 U.S. 938 (1981), *reh'g denied*, 453 U.S. 927 (1981). The court's holding that the Corporation has power to regulate oil and gas conservation measures on restricted Indian lands is based on a federal law granting jurisdiction to Oklahoma over lands of the Five Civilized Tribes for such conservation measures. *Id.* at 180.

87. *Id.* at 180 (noting *Draper v. United States*, 164 U.S. 240 (1896), and *Williams v. Lee*, 358 U.S. 217 (1959)).

88. *Id.* at 180.

89. 13 Okla. Op. Att'y Gen. 312 (1981).

90. Aller, *Survey of Available Technologies for Locating Abandoned Wells*, in PROCEEDINGS, *supra* note 6, at 125-26.

91. The following methods of locating polluting wells were compiled from Ms. Aller's article cited in note 91, *supra*, and L. ALLER, PROJECT SUMMARY: METHODS FOR DETERMINING THE LOCATION OF ABANDONED WELLS 3-5 (U.S. Environmental Protection Agency, EPA-600/S2-83-123, Feb. 1984).

can be made from sources such as regulatory agencies, leasing agreements, deeds, plat maps, and county land records. Conversations with and calls from local residents may reveal the actual locations of abandoned wells or past drilling activities in certain areas of the county or district. Many well plugging operations are initiated as a result of landowners calling to complain of abandoned wells or polluted groundwater.

The time consuming but tried and true method of walking over an area looking for evidence of past or present drilling may reveal pollution sources. Soil discoloration, evidence of filled-in pits, depressions created by heavy equipment, concrete foundations, or discarded tools all provide clues as to the location of a well.

Aerial photographs, used throughout the country since 1930, provide another tool for discovering abandoned wells. The United States Geological Survey (USGS) and National Cartographic Information Center (NCIC) maintain a listing of available aerial photographs for the United States. These photographs may be used to detect evidence of drilling such as derricks, rod lines, pits, or other surface features associated with drilling which have, with time, been obliterated on the surface.

Combustible gas indicators can be used to detect the presence of and to measure the quantity of gases such as methane. The equipment gives an indication of gas in the air and is operated by walking over an area with the machine. Ground penetrating radar is a geophysical method which uses radio waves transmitted into the ground and reflected back and recorded at the surface. The radar may be used to find disturbances such as casing and tubing associated with drilling activities.

Finally, remote sensing can be used to show surface features which are not normally evident at the surface. Remote sensing includes black and white aerial photographs, color and infrared photographs, and thermal imagery. The search method used will depend upon the objectives and resources of the search, and the condition and surface expression of the well.⁹²

4. Locating the Parties Who are Responsible

Another important task the Commission performs is finding out who is responsible for plugging the well. Because the Act provides the Commission with the power to plug a well, whether or not the person responsible can be found,⁹³ this issue is not as critical as it could be.

92. Aller, *supra* note 91, at 125.

93. OKLA. STAT. tit. 52, § 310 (1981 & Supp. 1986).

However, the state should not have to foot the bill for irresponsible operators who do not perform their duties. Whenever the Commission can find the person responsible, less taxpayer's money will be spent.

To find out who is responsible for plugging polluting wells, the Commission can search the same records used to find the location of the wells.⁹⁴ Asking adjoining lease and landowners, and in some cases asking residents within a small community if they knew who drilled in the area in the past, may reveal who is responsible for a well.⁹⁵ Additionally, most drillers or lessees leave a small template attached either to equipment on top of the well or to some nearby object, such as a fence or tree, which gives the name of the well, when it was drilled, and the name of the driller.

The research for this Comment indicates that many of the polluting wells were drilled twenty, sixty, or even eighty years ago.⁹⁶ Many persons responsible for plugging wells have either moved beyond the Commission's jurisdiction, gone out of business, cannot pay the cost of plugging, or have died.

5. Cost-Benefit Analysis

The Commission has been provided funding specifically for plugging or repairing wells which are causing pollution.⁹⁷ What is not shown by the statistics is the number of individual wells that cannot be plugged or repaired due to lack of funds. There are times when a cost-benefit analysis shows that the Commission has a choice between plugging ten or fifteen wells at a certain cost, or plugging only one individual well at the same cost. It is a difficult choice. There is no easy way to decide which wells the state can afford to plug.

Of the case files reviewed,⁹⁸ the cost of plugging a well ranged from \$808⁹⁹ to \$8,909.¹⁰⁰ The cost of plugging varies according to the depth of the well, whether or not the well penetrates water strata, the type of geologic formations penetrated, the size of the hole itself, and the loca-

94. *See supra* pp. 589-90.

95. *Id.*

96. *See* PD 15941, PD 16669 and PD 16123, Appendix A.

97. 1986 Okla. Sess. Laws, ch. 310, § 8 (Legislative allocation of \$500,000 to the Corporation Commission to plug or repair any oil, gas, injection, or disposal well which is causing pollution); *see supra* p. 585.

98. *See* Appendices A and B.

99. *See* PD 16560, Appendix A.

100. *See* PD 15827, Appendix A.

tion of the well. Because of these factors, it is not economically feasible to plug every abandoned well. A cost-benefit prioritization must be made.

6. Exemptions to Plugging Rules

While the bulk of this Comment has dealt with compliance and enforcement rules concerning permanent plugging of wells, there are rules allowing for an exemption from these permanent plugging rules.¹⁰¹ The types of wells specifically exempt from permanent plugging requirements are listed in OCC-OGR 3-401(E).¹⁰²

These rules address a legitimate concern of Oklahoma's oil and gas producers—the current low sale price of their products when compared to the cost of drilling and maintaining a producing well. As a result, many producers are prematurely and permanently plugging their wells because of the present poor economic climate. Many producers believe it would be more economical to temporarily shut-in or temporarily plug their wells rather than permanently close the well. Rule 3-401(E)-(K) allows most operators¹⁰³ to temporarily plug a well.¹⁰⁴ The rule as recently amended¹⁰⁵ provides a temporary extension for up to two years from the permanent plugging requirements applicable to producing wells. The two-year exemption saves the person responsible from the expense of permanently plugging a well and then having to completely redrill a new well on the same lease if the price of oil or gas should climb to profitable levels. The exemption benefits the Commission by giving operators an incentive to stay with the well, as opposed to abandoning it because of the high cost of permanent plugs.

The two-year extension period also allows the Commission to keep better track of who is responsible for plugging the wells. If there were no time limitation the lease might change hands many times, or the person responsible might go out of business or die, and the Commission would have to spend a lot of time and manpower finding out who was responsible for the well. With a two-year limit, the records are much less apt to

101. OCC-OGR, *supra* note 43, at 3-401(E)-(H).

102. *Id.* at 3-401(E)(4).

103. The term "most operators" refers to the fact that the exemptions are allowed only to operators of wells on producing leases. A producing lease is one where at least one well is producing oil or gas. If the lease is not producing the operator is not allowed an exemption.

104. OCC-OGR, *supra* note 43, at 3-401(E)(4)(b) allows the following types of temporary plugs: drillable, retrievable, temporary bridge, or tubing with suitable wellhead pack-off and packer.

105. Corporation Commission Order 303650 effective 10-1-86 (R.M. No. 000005) amended Rule 3-401(H) to allow the temporary plugging rules to be applicable to stripper wells (wells with production of less than ten barrels per day of oil or which qualify as NGPA Section 108 gas wells) which, in the past, had to be permanently plugged whenever they were shut-in.

change. Oklahoma is an oil-producing state, and the Commission is designed to help as well as regulate oil and gas well operators. The temporary plugging rules benefit all parties.

V. CONCLUSION

Oklahoma is blessed with an abundant supply of fresh water, much of which is groundwater. This groundwater is a very valuable but finite resource. As time goes on, the availability of clean potable water should make the state increasingly attractive to many industries which use water. In order to maintain this asset, the state should do everything possible to keep the water we have free of pollution.

A source of pollution to Oklahoma's groundwater comes from the discharge of oil, gas, and other deleterious substances from unplugged or improperly plugged oil and gas wells. This is not surprising because the oil and gas industry has played and still plays a vital role in the state's industrial and economic well-being.

Merely because the state is blessed with oil, gas, and water does not mean that uses of these resources must be in conflict. There is a way to prevent the pollution of the state's groundwater by oil and gas wells. Oklahoma passed an Act¹⁰⁶ in 1965 requiring that oil and gas well operators properly plug their wells when the wells are no longer producing or being used. The Act and the Commission's rules and regulations govern the plugging of wells provide penalties for those who fail to follow the guidelines. The Commission is charged with enforcement of laws, including the Act, concerning oil and gas operations within Oklahoma. The Commission's enforcement of the Act is, however, limited by budget and manpower constraints, and the Commissioner has difficult tasks, such as finding the polluting wells and the parties responsible for plugging or repairing them. One of the major features of the Act is the power given to the Commission to take action on a citizen's complaint and plug or repair a polluting well when the party responsible cannot be found or forced to plug the well.

The Commission has a complaint center in Oklahoma City, as well as in district offices, to which people can report leaking or polluting wells.¹⁰⁷ If the Commission can increase the public's participation in

106. See Act, *supra* note 18.

107. A Consumers Complaints and Information Department to the Oklahoma Corporation Commission was created in 1981 specifically to act as a consumer advocate in dealing with the oil and gas industry. If a citizen knows where a polluting well is, or believes that his water supply is being polluted by an oil or gas well, he can call this department in Oklahoma City (405-521-2613) to

finding polluting wells, and if the state legislature provides the funds for manpower and enforcement of the Act, the state's groundwater supply will remain clean, aiding the economic and industrial development of Oklahoma.

Herbert W. Wright, III

report the problem so that the Commission can investigate and, if necessary, take action. In addition, to report problems caused by oil and gas operations, citizens may call the Commission Conservation Division offices either in Oklahoma City or in one of the four district field offices in Bristow, Kingfisher, Duncan, or Ada.

APPENDIX A
SAMPLE OF STATE FUNDED WELL PLUGGINGS

POLLUTION DOCKET NO.	CORPORATION COMMISSION ORDER NO.	DATE	COUNTY	NUMBER OF WELLS	COST TO PLUG	MISCELLANEOUS NOTES
15344	264930	09-06-84	Kay	1	\$ 3,696	Leaking into Chickaskia River which feeds reservoir providing Blackwell's public water. Purging gas. Operator and driller unknown. Driller or operator responsible cannot be located.
15345	264228	08-20-84	Lincoln	2	\$ 6,200	Operator unknown and driller deceased.
15418	276473	04-16-85	Rogers	2	\$ 4,754	Purging gas into fresh water. Corporation responsible ceased business.
15827	275534	04-01-85	Nowata	65	\$18,144	Not presently, but capable of purging. Open pits and no casing in well. Driller and operator unknown.
15905	272262	01-28-85	Craig	8	\$ 6,056	Drilled at least 20 years ago. Operator unknown. Driller in bankruptcy. Well behind farm house. Capable of purging.
15941	272727	02-05-85	Cleveland	1	\$ 3,644	Open hole with casing only. Person responsible in bankruptcy. Obligation to reimburse Commission for plugging well not dischargeable.
15942	272712	02-04-85	Lincoln	1	\$ 2,560	Abandoned. Driller and operator unknown. Capable of purging.
16071	276286	04-15-86	Rogers	1	\$ 1,378	Abandoned more than four years ago. Never produced. Purging intermittently. Operator cannot be found.
16118	280797	06-24-85	Greer	1	\$ 2,224	Drilled prior to 1910. Purging gas bubble near occupied farm house. Foul odor to water well. Leaking into creek. Operator unknown.
16123	274879	03-19-85	Nowata	5	\$ 7,137	Abandoned over one year ago. Operator cannot be found. Capable of purging.
16150	276288	04-15-85	Wagoner	3	\$ 3,398	Drilled in 1981 but never produced. Currently purging. Person responsible cannot be found.
16462	285095	09-11-85	Rogers	1	\$ 1,197	

APPENDIX A CONTINUED
SAMPLE OF STATE FUNDED WELL PLUGGINGS

16559	285149	11-01-85	Rogers	1	\$ 848	Abandoned and never plugged. Driller insolvent. Vegetation dead around ground site.
16560	288167	11-05-85	Mayes	1	\$ 808	Contempt citation out on driller, but unable to locate. Bond expired.
16666	287955	11-01-85	Comanche	1	\$ 1,620	Drilled prior to 1981. Operator cannot be found and driller insolvent. Well never produced.
16669	288668	11-15-85	Stephens	1	\$ 8,909	Well drilled circa 1922 and owner deceased or cannot be found. Purging near high-pressure gas line. Emergency plugging.
16749	—	09-17-84	Muskogee Wagoner	6 5	- -	Cancelled for lack of state funds.
17260	293834	02-28-86	Nowata	14	\$12,886	Wells drilled approximately 1904. Purging salt water. Operator and driller unknown.
17288	296916	04-24-86	McCurtain	4	\$ 810	Wells abandoned and purging oil and salt water into stream and water slough. Driller and operator unknown.
17323	298098	05-14-86	Tulsa	1	\$ 4,000	Purging gas near community swimming pool. Well has existed since at least 1971. Cannot locate operator or driller.
17658	300014	07-03-86	Nowata	1	\$ 7,950	Well located under man-made lake. Well plug broken and lake had to be drained. Emergency.
17741	300364	07-14-86	Jefferson	1	\$ 3,300	Abandoned well purging salt water (15-20 barrels per day). Unable to locate driller or operator. Emergency.
17829	303211	09-22-86	Tulsa	1	\$ 2,446	"Spewing" salt water straight into the air. Was initially plugged in 1958. Operator is deceased and driller unknown. Emergency.
17924	302125	08-26-86	Washington	1	N/A	Purging gas well in residential backyard. Caused six foot crater. Risk of fire or explosion. Driller and operator unknown. No well records when drilled.

APPENDIX B
SAMPLE OF CONTENT CITATIONS REVIEWED

ENFORCEMENT DOCKET NO.	CORPORATION COMMISSION ORDER NO.	ORDER DATE MO/YR	RESPONDENT	COUNTY	FINE	MISCELLANEOUS NOTES
EN 000008	287759	10-30-85	Daner Oil, Inc.	Pontotoc	\$50,000	Failure to plug one well. Liable and remains liable to plug.
EN 000043	294513	3-11-86	Gulf American Resources, Inc.	Mayes	\$698,000	55 wells with bad plugs. Liable and remains liable to plug.
EN 000049	301053	7-28-86	Edward P. O'Brien	Logan	\$10,000	Failure to plug one well. Liable and remains liable to plug.
EN 000083	296594	4-21-86	Cheyenne Exploration	Roger Mills	\$45,000	Operator in bankruptcy. Fined amount it cost Commission to clean up site.
EN 000102	300075	7-7-86	Derrick/Couch Petroleum, Inc.	Jackson	\$44,600	Well was unplugged and operator was in bankruptcy.
EN 000130	297823	5-8-86	Creek Energy & Development	Creek	\$10,000	Surface owner called in complaint of unplugged well.
EN 000137	294722	3-14-86	Fred B. Cosper	Okfuskee	\$500	Ordered to plug one well.
EN 000167	297238	4-29-86	B&H Well Service, Inc.	Okmulgee	\$5,000	Failure to plug two wells and clean up site.
GC 28892	294916	3-19-86	Lamar Petroleum	Rogers	\$35,000	Ordered to plug five wells and clean up site.
GC 29243	271888	1-21-85	Triton Energy & Development	Wagoner	\$15,000	Ordered to plug two wells and clean up site.
GC 29278	284432	8-28-85	D.L.D. Petroleum, Inc.	Hughes	\$50,000	Ordered to plug four wells.

